

ABSTRACT

The present invention encompasses a high efficiency pulse width modulator comprising:
a variable duty cycle oscillator for receiving an input signal and providing a low level
5 switching signal; a source voltage differentiation dependant positive switching signal
circuit for receiving the low level switching signal, a stable reference signal, a sample of
a positive supply voltage signal, and an error signal and the providing a positive supply
switching signal and a reference signal; a positive supply switching circuit for receiving
the positive supply switching signal and providing an output signal to an inductive load;
10 an output voltage dependant negative supply switching signal circuit for receiving the
output signal and a negative supply voltage signal and providing a negative supply
switching signal; a negative supply switching circuit for receiving the negative supply
switching signal and providing clamping of the inductive load to the negative supply, an
output sourced charge pump for receiving the output signal and the positive supply
15 voltage signal and providing a high voltage power supply; an output comparison circuit
for receiving a sample of the output signal and a reference signal from the positive supply
switching circuit, comparing the output signal to the reference signal and turning off the
positive supply switching circuit when the output signal is lower than the reference
signal; and a timing circuit for receiving an error signal from the comparison circuit and
20 providing a feedback signal to the error circuit.